CLAIMS

1. Formulation (F) intended for use in an operation of rinsing (R) textile fiber articles (S) by means of an aqueous or aqueous-alcoholic medium (MR), said formulation (F)

- comprising at least one active substance (A) comprising a solid organic polymer in particulate form and a vehicle (V) comprising at least one organic polymer, capable of taking said active substance (A) to the surface of said textile fiber articles (S) in the rinsing operation (R),
- in the form:
    - of a stable dispersion, with a pH of from 2 to 5, of said active substance (A) in an aqueous or aqueous-alcoholic medium (MAV) comprising said vehicle (V), or
    - in a solid form obtained by drying said dispersion,

the nature of the active substance (A), of the aqueous or aqueous-alcoholic medium (MAV), and of the vehicle (V) being such that

* the active substance (A)
    - is insoluble in the medium (MAV),
    - has an overall zero or cationic charge in the medium (MAV),
    - is stabilized in the medium (MAV) by means of a cationic surfactant (TAC), it

being possible for said cationic surfactant (TAC) to be wholly or partly replaced by a nonionic surfactant when the polymer constituting the active substance (A) is intrinsically cationic or intrinsically potentially cationic in the medium (MAV),

- remains insoluble in the rinsing medium (MR) or is capable of swelling in the rinsing medium (MR);

* the vehicle (V)
  - is soluble or dispersible in the medium (MAV) and in the rinsing medium (MR),
  - has an overall cationic or zero ionic charge in the medium (MAV),
  - at the pH of the rinsing operation in the rinsing medium (MR) is capable of developing anionic charges in sufficient quantity to destabilize the active substance (A) in the rinsing medium (MR).

2. Formulation according to Claim 1), characterized in that the rinsing medium (MR) has a pH of from 5.5 to 8.

3. Formulation according to Claim 1) or 2), characterized in that the polymer constituting the active substance (A) is selected from

a) nonionic polymers derived from at least one nonionic hydrophobic monomer

b) copolymers derived from at least one nonionic hydrophobic monomer and at least one monomer which is cationic or potentially cationic in the medium (MAV), and optionally at least one monomer which is neutral in the medium (MAV) and potentially anionic in the rinsing medium (MR)

c) copolymers derived from at least one nonionic hydrophobic monomer and at least one monomer which is neutral in the medium (MAV) and potentially anionic in the rinsing medium (MR).

4. Formulation according to Claim 3), characterized in that the monomer composition from which said polymer is derived further comprises

- at least one noncharged or nonionizable hydrophilic monomer, preferably in an amount not exceeding 50% of the total mass of the monomers
- and/or at least one zwitterionic monomer, preferably in an amount not exceeding 30% of the total mass of the monomers,
- and/or at least one crosslinking monomer, preferably in an amount not exceeding 10% of the total mass of the monomers.

5. Formulation according to Claim 3) or 4), characterized in that the copolymer b) further

comprises an anionic monomer whose first pKa is less than 3, in an amount sufficiently low that said copolymer b) has a cationic overall charge in the medium (MAV).

6. Formulation according to any one of Claims 3) to 5), characterized in that, when said polymer constituting the active substance (A) is an ionic or ionizable copolymer, the selection and relative amounts of monomers from which said copolymers are derived are such that the active substance (A)

- is insoluble in the medium (MAV)
- exhibits a zero or cationic overall charge in (MAV)
- remains insoluble in the rinsing medium (MR) or is incapable of swelling by more than 8 times, preferably not more than 4 times, its volume in the rinsing medium (MR).

7. Formulation according to any one of Claims 1) to 6), characterized in that the particles of polymer constituting the active substance (A) have an average diameter ranging from 10 nm to 10 μm, preferably from 10 nm to 1 μm, and more preferably from 10 nm to 500 nm.

8. Formulation according to any one of Claims 1) to 7), characterized in that the monomers from which the polymers constituting the active substance (A) are derived are α-β monoethylenically

unsaturated or diethylenically unsaturated in the case of the crosslinking monomers.

9. Formulation according to any one of Claims 1) to 8), characterized in that the selection and relative amounts of the monomer or monomers from which the polymer constituting the active substance (A) are derived are such that said polymer has a glass transition temperature Tg of from -80°C to +150°C, more particularly from -80°C to +40°C.

10. Formulation according to any one of Claims 1) to 9), characterized in that the polymer constituting the active substance (A) is insoluble in the medium (MAV) and in the rinsing medium (MR), and in that it is selected from polymers derived from at least one nonionic hydrophobic monomer and copolymers derived from at least one nonionic hydrophobic monomer and from 0.1 to 20% of their weight of at least one monomer which is potentially cationic in the medium (MAV).

11. Formulation according to any one of Claims 1) to 9), characterized in that the polymer constituting the active substance (A) is an organic copolymer which is insoluble in the medium (MAV) with a pH of from 2 to 5, is capable of swelling in the rinsing medium (MR) with a pH of from 5.5 to 8, and is capable of dissolving in the washing bath during a subsequent washing operation at a pH of from 8.5 to 11.

12. Formulation according to Claim 11),

characterized in that said polymer constituting the active substance (A) capable of swelling is a copolymer derived from at least one nonionic hydrophobic monomer and from 10 to 50% of its weight of at least one monomer which is potentially anionic in the rinsing medium (MR).

13. Formulation according to any one of Claims 1) to 12), characterized in that the amount of nonionic surfactant represents less than 70% of the weight of all of the surfactants (TAC).

14. Formulation according to any one of Claims 1) to 13), characterized in that the ratio of the mass of polymer constituting the active substance (A) to the mass of surfactant (TAC) is from 0.01 to 10, preferably from 0.01 to 1.

15. Formulation according to any one of Claims 1) to 14), characterized in that the cationic charges generated by the optional cationic or potentially cationic units of the copolymer constituting the active substance (A) and by the cationic surfactant or surfactants at the surface of the polymer constituting the active active substance (A) in dispersion in the medium (MAV) are such that the zeta potential of said polymer or copolymer in dispersion in (MAV) is from 0 to +50 mV, preferably from +10 to +40 mV.

16. Formulation according to any one of

Claims 1) to 15), characterized in that the dispersion medium (MAV) for the active substance (A) is water or an aqueous-alcoholic polar medium.

17. Formulation according to Claim 16), characterized in that the alcohol or alcohols present in the aqueous-alcoholic polar medium represent up to 70% of the volume of the medium (MAV).

18. Formulation according to any one of Claims 1) to 17), characterized in that the polymer constituting the vehicle (V) is any polymer which is soluble or dispersible in aqueous or aqueous-alcoholic medium with a pH of between 2 and 8 and which comprises at least one unit which is neutral in the medium (MAV) and potentially anionic (HA) in the rinsing medium (MR).

19. Formulation according to Claim 18), characterized in that the vehicle (V) polymer further comprises at least one unit which is cationic or potentially cationic (HC) in the medium (MAV) and/or at least one hydrophilic or hydrophobic nonionic unit.

20. Formulation according to any one of Claims 1) to 19), characterized in that the relative amounts of the various units of the polymer constituting the vehicle (V) are such that in the medium (MAV) the overall charge of the polymer or copolymer is zero or cationic.

21. Formulation according to any one of

Claims 1) to 20), characterized in that the relative amounts of vehicle (V) polymer, surfactant (TAC), and polymer constituting the active substance (A) are such that in the course of the rinsing operation the number of anionic charges developed in the rinsing medium (MR) by the vehicle polymer (V) is sufficient to destabilize the active substance (A) in the rinsing medium (MR), in particular by electrostatic attraction with the surface charges of the active substance (A) in the medium (MR).

22. Formulation according to Claim 21), characterized in that the number of anionic charges developed in the rinsing medium (MR) by the vehicle (V) polymer to destabilize the active substance is at least 1% relative to the number of cationic surface charges of the active substance (A) in the medium (MR), and not more than 200% relative to the number of cationic surface charges of the active substance (A) in the medium (MR).

23. Formulation according to any one of Claims 1) to 22), characterized in that the polymer constituting the vehicle (V) is a polymer selected from polymers derived from ethylenically unsaturated monomers, potentially anionic natural polysaccharides, potentially anionic or amphoteric substituted or modified polysaccharides, or mixtures thereof.

24. Formulation according to any one of Claims 1) to 23), characterized in that the polymer

constituting the vehicle (V) is a polymer derived

- from at least one α-β monoethylenically unsaturated monomer which is neutral in the medium (MAV) and potentially anionic (HA) in the rinsing medium (MR) and
- optionally at least one α-β monoethylenically unsaturated monomer which is cationic or potentially cationic (HC) in the medium (MAV), and
- optionally at least one nonionic α-β monoethylenically unsaturated monomer which is hydrophilic or hydrophobic, preferably hydrophilic.

25. Formulation according to any one of Claims 1) to 24), characterized in that the polymer constituting the vehicle (V) is a random, block or graft copolymer derived:

- from at least one α-β monoethylenically unsaturated hydrophilic monomer which is neutral in the medium (MAV) and potentially anionic (HA) in the rinsing medium (MR) and
- from at least one α-β monoethylenically unsaturated hydrophilic monomer which is cationic or potentially cationic (HC) in the medium (MAV),
- and optionally from at least one nonionic α-β monoethylenically unsaturated monomer which is hydrophilic or hydrophobic, preferably hydrophilic.

26. Formulation according to any one of Claims 1) to 25), characterized in that the polymer

constituting the vehicle (V) derives from one or more α-β monoethylenically unsaturated monomers and has an average molar mass of greater than 5 000 g/mol, preferably from 20 000 to 500 000 g/mol.

27. Formulation according to any one of Claims 1) to 26), characterized in that the polymer constituting the vehicle (V) is selected from

- polyacrylic or polymethacrylic acids, alkali metal polyacrylates or polymethacrylates, preferably with a molar mass by weight of from 100 000 to 1 000 000 g/mol
- acrylic acid/DADMAC copolymers, with a molar ratio of 50/50 to 30/70, preferably with a molar mass by weight of from 70 000 to 350 000 g/mol
- acrylic acid/MAPTAC copolymers, with a molar ratio of 60/40 to 30/70, preferably with a molar mass by weight of from 90 000 to 300 000 g/mol
- acrylic acid/MAPTAC/linear C_4-C_{18} alkyl methacrylate terpolymers comprising 0.005 to 10% by mass of alkyl methacrylate, with an acrylic acid/MAPTAC molar ratio ranging from 60/40 to 30/70, and preferably having a molar mass by weight of from 50 000 to 250 000 g/mol
- acrylic acid/dimethylaminoethyl methacrylate (DMAEMA) copolymers, with a molar ratio of 60/40 to 30/70, preferably with a molar mass by weight of from 50 000 to 300 000 g/mol.

28. Formulation according to any one of Claims 1) to 23), characterized in that the polymer constituting the vehicle (V) is a potentially anionic natural polysaccharide formed of nonionic monosaccharide units and of monosaccharide units which are neutral in the medium (MAV) and potentially anionic in the rinsing medium (MR), and are alike or different.

29. Formulation according to Claim 28), characterized in that said potentially anionic natural polysaccharide is a branched polysaccharide formed

- of a main chain comprising alike or different anhydrohexose units
- and of branches comprising at least one anhydropentose and/or anhydrohexose unit which is neutral in the medium (MAV) and optionally potentially anionic in the rinsing medium (MR).

30. Formulation according to Claim 28) or 29), characterized in that said potentially anionic natural polysaccharide is a xanthan gum, a succinoglycan, a rhamsan, a gellan gum or a welan gum.

31. Formulation according to any one of Claims 28) to 30), characterized in that said potentially anionic natural polysaccharide has a molar mass by weight of from 2 000 to 5 000 000, preferably from 10 000 to 5 000 000, more particularly from 10 000 to 4 000 000 g/mol.

32. Formulation according to any one of Claims 1) to 23), characterized in that the polymer constituting the vehicle (V) is a substituted or modified polysaccharide whose native skeleton is formed of nonionic monosaccharide units and/or of monosaccharide units which are neutral in the medium (MAV) and potentially anionic in the rinsing medium (MR), said monosaccharide units being alike or different and being substituted or modified

- by one or more groups which carry at least one charge which is neutral in the medium (MAV) and potentially anionic in the medium (MR)
- and optionally by one or more groups which carry at least one charge which is cationic or potentially cationic in the medium (MAV),

the degree of substitution or modification of the monosaccharide units by the entirety of the groups which carry charges which are potentially anionic and of optional groups which carry cationic charges being such that said substituted or modified polysaccharide is soluble or dispersible in aqueous or aqueous-alcoholic medium and has an overall cationic or zero charge in the medium (MAV).

33. Formulation according to Claim 32), characterized in that said substituted or modified polysaccharide further comprises at least one nonionic

modifying or substituent group.

34. Formulation according to Claim 32) or 33), characterized in that said substituted or modified polysaccharide is a substituted or modified branched polysaccharide whose native skeleton is formed

- of a main chain comprising alike or different anhydrohexose units
- and of branches comprising at least one anhydropentose and/or anhydrohexose unit which is neutral in the medium (MAV) and optionally potentially anionic in the rinsing medium (MR),

the anhydrohexose and/or anhydropentose units of said polysaccharide being substituted or modified by one or more groups which carry at least one charge which is neutral in the medium (MAV) and potentially anionic in the medium (MR) and optionally at least one charge which is cationic or potentially cationic in the medium (MAV),

the degree of substitution or modification DSi of the anhydrohexose and/or anhydropentose units by the entirety of said groups which carry charges which are ionic or potentially ionic ranging from 0.01 to less than 3, preferably from 0.01 to 2.5,

with a ratio of the number of potentially anionic charges in the medium (MR) to the number of cationic or potentially cationic charges in the medium (MAV)

ranging from 100/0 to 30/70, preferably from 100/0 to 50/50.

35. Formulation according to any one of Claims 31) to 34), characterized in that said substituted or modified polysaccharide has a molar mass by weight of from 2 000 to 5 000 000, preferably from 10 000 to 5 000 000 g/mol.

36. Formulation according to any one of Claims 31) to 35), characterized in that the native skeleton of said substituted or modified polysaccharide is a galactomannan.

37. Formulation according to any one of Claims 31) to 36), characterized in that the native skeleton of said substituted or modified polysaccharide is selected from

- carboxymethylgalactomannans, especially carboxymethylguars,
- carboxymethylhydroxypropylgalactomannans, especially carboxymethylhydroxypropylguars,
- carboxymethyl-hydroxypropyltrimethylammonium chloride galactomannans, especially carboxymethyl-hydroxypropyltrimethylammonium chloride guars,
- carboxymethylhydroxypropyl-hydroxypropyl-trimethylammonium chloride galactomannans, especially carboxymethyl-hydroxypropyl-hydroxypropyltrimethylammonium chloride

guars.

38. Formulation according to any one of Claims 1) to 37), characterized in that the amount of vehicle (V) present in said formulation is from 0.001 to 5 parts by weight, preferably from 0.01 to 4 parts by weight, and more particularly from 0.05 to 2 parts by weight per 100 parts by weight of active substance (A).

39. Formulation according to any one of Claims 1) to 38), characterized in that it is in the form of an aqueous or aqueous-alcoholic dispersion comprising per 100 parts of its weight:

- from 0.01 to 40, preferably from 0.05 to 30 parts by dry weight of active substance (A)
- from 0.01 to 50, preferably from 0.01 to 35 parts by dry weight of surfactant (TAC)
- from 0.001 to 4, preferably from 0.01 to 1 part by dry weight of vehicle (V) polymer.

40. Formulation according to any one of Claims 1) to 39), characterized in that it further comprises one or more customary constituents of cationic rinsing formulations, selected from cationic softeners, optical brighteners, color transfer inhibitors, water-soluble monovalent mineral salts, silicone oils, animal, vegetable or mineral hydrocarbon waxes or oils, dyes, fragrances, foam suppressants, enzymes and bleaches.

41. Formulation according to any one of Claims 1) to 40), characterized in that the solid active substance (A) in particulate form contains, encapsulated within its particles, at least one liquid or solid hydrophobic organic active substance (MAO) other than (A).

42. Formulation according to Claim 41), characterized in that said liquid or solid hydrophobic organic active substance (MAO) is a fragrance, a biocide, an anti-UV agent, an optical brightener, a silicone or aminosilicone oil or a mineral or vegetable oil.

43. Process for treating textile fiber articles by contacting said articles in the course of a rinsing operation in aqueous or aqueous-alcoholic medium with the rinsing formulation (F) of any one of Claims 1) to 42), and recovering said rinsed articles.

44. Process intended to enhance the antiwrinkle and/or easy-iron and/or soil release properties of textile fiber articles, which consists in contacting said articles in the course of a rinsing operation in aqueous or aqueous-alcoholic medium with the rinsing formulation (F) of any one of Claims 1) to 41), and in recovering said rinsed articles.

45. Process according to Claim 44), characterized in that the solid active substance (A) in particulate form in the formulation (F) contains,

encapsulated within its particles, at least one liquid or solid hydrophobic active substance (MAO) other than (A), and in that said process is further intended to confer on said textile fiber articles additional benefits intrinsic to said hydrophobic organic active substance (MAO).

46. Process according to Claim 45), characterized in that said hydrophobic organic active substance (MAO) is a liquid or solid fragrance and in that said process is intended additionally to provide said textile fiber articles with fragrancing properties.

47. Use in a formulation (F) intended for use in an operation of rinsing (R) textile fiber articles (S) by means of an aqueous or aqueous-alcoholic medium (MR), formulation (F) comprising at least one active substance (A) comprising at least one solid organic polymer in particulate form and being

- in the form of a stable dispersion with a pH of from 2 to 5 of said active substance (A) in an aqueous or aqueous-alcoholic medium (MAV) or
- in a solid form obtained by drying said dispersion,

the nature of the active substance (A) and of the aqueous or aqueous-alcoholic medium (MAV) being such that the active substance (A)

- is insoluble in the medium (MAV)
- has an overall zero or cationic charge in the medium (MAV),

- is stabilized in the medium (MAV) by means of a cationic surfactant (TAC), it being possible for said cationic surfactant (TAC) to be wholly or partly replaced by a nonionic surfactant when the polymer constituting the active substance (A) is intrinsically cationic or intrinsically potentially cationic in the medium (MAV)
  - remains insoluble in the rinsing medium (MR) or is capable of swelling in the rinsing medium (MR);

of at least one organic polymer which

- ◆ is soluble or dispersible in the medium (MAV) and in the rinsing medium (MR)
- ◆ has an overall cationic or zero ionic charge in the medium (MAV)
- ◆ and is capable, at the pH of the rinsing operation in the rinsing medium (MR), of developing anionic charges in sufficient quantity to destabilize the active substance (A) in the rinsing medium (MR);

as a vehicle (V) capable of bringing said active substance (A) toward the surface of said textile fiber articles (S) in the rinsing operation (R).

48. Use according to Claim 47),

characterized in that the solid active substance (A) in particulate form contains, encapsulated within its particles, at least one liquid or solid hydrophobic organic active substance (MAO) other than (A), and in that said organic vehicle (V) polymer is further capable of enhancing the retention of said organic active substance (MAO) on the surface of textile fiber articles.

49. Use according to Claim 48), characterized in that the hydrophobic organic active substance (MAO) is a liquid or solid fragrance, and in that said organic vehicle (V) polymer is further capable of enhancing the retention of said fragrance on the surface of textile fiber articles.

50. Process for enhancing the deposition of an active substance (A) comprising at least one solid organic polymer in particulate form, optionally containing, encapsulated within its particles, at least one liquid or solid hydrophobic organic active substance (MAO) other than (A), on the surface of textile fiber articles (S), during an operation of rinsing of said articles by means of an aqueous or aqueous-alcoholic medium (MR) obtained from a formulation (F) comprising said active substance (A), the formulation (F) being

- in the form of a stable dispersion with a pH of from 2 to 5 of said active substance (A)

in an aqueous or aqueous-alcoholic medium (MAV) or

- in a solid form obtained by drying said dispersion,

the nature of the active substance (A) and of the aqueous or aqueous-alcoholic medium (MAV) being such that the active substance (A)

- is insoluble in the medium (MAV)
- has an overall zero or cationic charge in the medium (MAV),
- is stabilized in the medium (MAV) by means of a cationic surfactant (TAC), it being possible for said cationic surfactant (TAC) to be wholly or partly replaced by a nonionic surfactant when the polymer constituting the active substance (A) is intrinsically cationic or intrinsically potentially cationic in the medium (MAV)
- remains insoluble in the rinsing medium (MR) or is capable of swelling in the rinsing medium (MR);

by adding to said formulation (F) a vehicle (V) comprising at least one organic polymer which

- is soluble or dispersible in the medium (MAV) and in the rinsing medium (MR)
- has an overall cationic or zero ionic charge in the medium (MAV)

- and is capable, at the pH of the rinsing operation in the rinsing medium (MR), of developing anionic charges in sufficient quantity to destabilize the active substance (A) in the rinsing medium (MR).

51. Process according to Claim 58), characterized in that the hydrophobic organic active substance (MAO) is a liquid or solid fragrance.

52. Processes according to any one of Claims 43) to 46), 50) or 51), or use according to any one of Claims 47) to 49), characterized in that the amount of formulation employed, expressed in terms of dry matter, is from 0.001 to 5 g/l, preferably from 0.05 to 2 g/l in the rinsing bath.